TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during August 1944. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*—Continued

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (12 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	276	5.1	31	177	5.3	29	149	2.4	31	264	0.9	31	6	1.4	30	202	1.6	30	208	2.9	31	144	4.3	31	270	3.7	30	266	3.4	30	273	2.3	31	227	2.0	30	188	2.3
500	30	281	3.9	31	179	5.4	29	166	3.3	31	242	1.4	---	---	---	30	212	1.7	30	202	2.6	31	145	4.4	31	289	2.8	30	264	4.4	30	227	1.6	---	---	---	30	217	2.3
1,000	30	285	3.4	31	185	5.6	29	176	4.4	31	245	2.1	31	346	1.6	29	202	1.8	29	215	3.7	31	154	4.3	30	280	2.0	30	264	6.0	25	247	0.9	31	229	2.8	29	242	3.0
1,500	30	291	3.3	30	195	5.9	28	201	4.3	31	234	2.1	31	347	0.6	27	234	1.7	29	220	5.4	28	152	5.2	30	285	2.0	28	258	6.4	21	286	1.1	31	232	2.3	27	274	3.0
2,000	29	269	2.7	30	207	5.6	23	213	4.6	30	254	2.3	29	246	1.7	25	258	3.1	27	233	6.8	27	149	5.3	30	260	2.7	28	262	7.4	18	290	1.6	31	242	3.7	27	292	3.6
2,500	29	255	3.2	30	223	4.6	19	219	5.0	30	258	2.4	28	253	5.2	24	266	4.8	20	252	7.2	26	157	3.7	30	240	3.3	26	265	9.5	17	286	2.7	30	240	4.0	25	294	4.7
3,000	29	242	3.8	27	232	4.3	17	243	4.7	30	257	2.7	27	250	7.2	23	271	5.5	20	262	7.6	22	146	2.7	29	225	4.0	23	267	9.1	16	273	4.0	26	243	4.8	24	293	5.3
4,000	28	234	5.4	25	255	4.1	14	278	6.8	30	241	2.4	24	268	10.9	22	286	6.8	18	267	11.6	19	142	2.5	29	217	4.4	22	273	11.5	14	270	4.6	20	253	6.8	20	283	4.7
5,000	26	240	6.9	20	294	5.2	11	292	8.9	29	237	2.5	21	275	13.4	18	305	8.0	12	273	14.6	13	79	1.5	27	222	5.2	21	283	10.1	12	289	5.0	19	254	8.6	18	291	5.4
6,000	25	239	9.0	14	296	3.6	10	293	10.3	29	249	2.1	17	272	15.4	15	313	8.9	10	280	17.7	11	4	4.2	26	224	4.3	20	277	12.3	---	---	---	17	252	9.7	14	300	7.7
8,000	22	239	12.1	---	---	---	---	---	---	25	249	4.9	10	277	20.1	11	300	10.3	---	---	---	---	---	---	22	242	5.6	---	---	---	---	---	---	16	250	13.2	12	298	9.4
10,000	21	238	19.4	---	---	---	---	---	---	24	257	8.2	---	---	---	---	---	---	---	---	---	---	---	---	20	234	10.3	---	---	---	---	---	---	13	254	15.3	10	305	9.2
12,000	17	239	28.8	---	---	---	---	---	---	24	268	9.0	---	---	---	---	---	---	---	---	---	---	---	---	19	246	12.8	---	---	---	---	---	---	10	244	18.2	---	---	---
14,000	10	243	24.6	---	---	---	---	---	---	17	251	6.8	---	---	---	---	---	---	---	---	---	---	---	---	17	243	10.2	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	11	199	5.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Maximum free air wind velocities, (m. p. s.) for different sections of the United States based on pilot-balloon observations during August 1944*

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	31.0	W.	2,170	12	Burlington, Vt.	47.2	N.	5,000	25	Albany, N. Y.	55.4	WSW.	11,622	7	Portland, Maine.
East-Central [2]	32.2	NNW.	1,401	18	Charlotte, N. C.	36.0	W.	4,777	26	Hatteras, N. C.	40.0	NNW.	7,817 8,357	25	Huntington, W. Va.
Southeast [3]	24.1	E.	1,367	20	Charleston, S. C.	22.6	SW.	4,248	31	Birmingham, Ala.	28.6	W.	19,100	30	Jacksonville, Fla.
North-Central [4]	44.6	SW.	1,575	10	St. Paul, Minn.	42.5	NNW.	3,202	31	Bismarck, N. Dak.	55.0	NW.	9,510	24	St. Paul, Minn.
Central [5]	44.2	S.	1,585	14	Kansas City, Mo.	38.0	WNW.	4,389	5	Sioux City, Iowa.	40.0	NW.	9,537	25	Indianapolis, Ind.
South-Central [6]	37.3	S.	818	25	Tulsa, Okla.	27.4	N.	4,286	30	Big Spring, Tex.	40.0	SW.	13,229	31	Waco, Tex.
Northwest [7]	34.6	WNW.	2,500	10	Ellensburg, Wash.	38.8	WNW.	4,704	10	Great Falls, Mont.	62.0	SW.	11,761	18	Pendleton, Oreg.
West-Central [8]	24.8	S.	2,464	21	Salt Lake City, Utah	33.9	WSW.	5,000	31	Reno, Nevada	62.0	SW.	10,365	2	Ely, Nev.
Southwest [9]	34.0	W.	2,304	22	Mt. Laguna, Calif.	33.9	W.	4,014	15	Raton, N. Mex.	53.2	WSW.	11,963	2	Santa Maria, Calif.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By C. R. JORDAN

DROUGHT conditions continued during the month over most of the country east of the Mississippi River with precipitation averaging only about 50 percent of normal over a considerable area. Heavy precipitation occurred in southern Texas, the lower Missouri Valley, the northern Great Plains, and in a few other limited areas. Precipitation west of the Rockies was less than 50 percent of normal over much of the area, with California, Nevada, and portions of Oregon, Idaho, Wyoming, Utah, and Arizona reporting no appreciable rainfall.

Streamflow declined more than seasonally along the Atlantic Coast and runoff during August averaged only 50 percent of normal in a region extending from Virginia to Nova Scotia, according to the monthly review of the U. S. Geological Survey. The stage of the Scioto River at Chillicothe, Ohio, fell to a stage of 0.9 foot from August 9–14, 1944, 0.1 foot lower than any previous stage of record, and undoubtedly the lowest river stage at Chillicothe since the great drought of 1908. Local flooding was reported in eastern Maryland during the first few days of August from torrential rainfall that accompanied the passing of a tropical storm. Flooding also occurred in Iowa, Missouri, Kansas, Nebraska, and Texas.

Atlantic Slope Drainage.—A tropical storm moved inland at Wilmington, N. C., on August 1, passed north through Virginia and northeast across Maryland, passing Annapolis, Md., early on August 3. The maximum official rainfall measurement reported was 7.72 inches at Cheltenham, Md., but it is estimated that amounts from 12 to 15 inches occurred in the area just west of Annapolis. Local flooding occurred, particularly on the Bacon Ridge Branch and North River. Record stages occurred on both streams.

Otherwise river stages continued generally low.

Upper Mississippi Basin.—Stream flow was considerably above normal, especially in the western portion of the basin. Local flooding was reported in central Iowa near the end of the month.

Missouri Basin.—Slight overflow of the Solomon River at Beloit, Kans., occurred on the 3d, 27th, and 31st.

In the Republican Basin, slight overflows occurred in Sappa Creek near Beaver City, Nebr., and along Prairie Dog Creek at Norton, Kans. No overflows were reported

in the main channel above Scandia, Kans. At the latter place and also at Concordia, Kans., slight overflows occurred on the 26th. At and below Clay Center, Kans., slight to moderate overflows occurred on the 26th, with a crest of 18.4 feet, 3.4 feet above bankful, at Clay Center on that day. Another slight overflow occurred at Clay Center on the last day of the month.

Slight overflows of the Little Blue River crested at Hanover, Kans., on the 20th, 26th, and 30th and at Endicott, Nebr., on September 1. The greatest overflow since the record-breaking flood of June 1941 along the Big Blue River at and below Blue Rapids, Kans., began on the 25th and crested the following day. The crest at Blue Rapids was 12.6 feet above flood stage, and at Randolph, Kans., the crest was 6.4 feet above flood stage.

Light overflow also occured during the month along the Kansas, Grand, Osage, and extreme lower Missouri River.

Owing to the fact that most crops, except corn, in the area had matured and had been harvested, damage resulting from the August overflows was comparatively small. Preliminary estimates show the following losses: Republican River, $25,000, occurring mostly in the vicinity of Clay Center, Kans.; Blue River, $91,000, mostly to highways, bridges, and crops; Kansas River, $17,000, mostly to highways and bridges. In the other streams, no damage of consequence occurred.

West Gulf of Mexico Drainage.—Excessive rains occurred in the middle portion of the Nueces River Basin and in the upper Pedernales River Basin in southwest Texas near the end of the month. Almost 18 inches fell at Bankersmith, Tex., in the 4-day period August 27–31. The Pedernales River reached the highest stage ever recorded near Johnson City, Tex. A flood was in progress on the Nueces River at the end of the month, the crest having passed Cotulla, Tex., on the 30th with the stage 11.6 feet above flood stage.

On the night of August 23–24, a cloudburst occurred over a small section of Presidio County, Tex., north of the Chinati Mountains, in the upper watershed of Cibolo Creek. Unofficial reports place the amount of rainfall at about 5 inches. A flash flood along the creek resulted that overflowed a section of Highway 67, about 200 yards of the Santa Fe Railroad track, 250 acres of maturing crops, and some streets of Presidio. The approaches of the long bridge, 4 miles north of Presidio were washed away. Seven adobe houses were destroyed. Damage was estimated at $67,500.

Light to moderate flooding occurred along the lower Rio Grande, at and below Rio Grande City, Tex., from August 24 to September 5. The rise started from heavy rains over the Rio Grande Valley and the San Juan River watershed that occurred in connection with a tropical disturbance that moved inland just south of Brownsville, Tex., on August 22. Heavy rains again fell over the valley on the 27th, 28th, and 30th, that maintained the high stages for several days. Damage caused by the flood was not large.

FLOOD-STAGE REPORT FOR AUGUST 1944

[All dates in August unless otherwise indicated]

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
	Feet			*Feet*	
Middle: Indianola, Iowa	14	26	27	16.1	27
Mississippi: Louisiana, Mo	12	4	4	12.0	4
		9	9	12.0	9
		16	24	12.3	17
		26	26	12.0	26
		30	30	12.0	30
Missouri Basin					
Solomon: Beloit, Kans	18	3	3	19.8	3
		27	27	20.0	27
		31	Sept. 1	21.2	Sept. 1
Republican:					
Guide Rock, Nebr	9	25	26	9.8	25
Scandia, Kans	10	26	26	11.0	26
Concordia, Kans	8	26	26	8.5	26
Clay Center, Kans	15	26	27	18.4	26
		29	29	15.8	29
		30	31	16.2	31
Wakefield, Kans	11	26	26	12.0	26
Junction City, Kans	10	26	26	11.0	26
Little Blue:					
Endicott, Nebr	11	30	Sept. 1	12.5	Sept. 1
Hanover, Kans	14	20	20	16.5	20
		25	27	16.6	26
		30	Sept. 1	16.6	30
Big Blue:					
Barnston, Nebr	18	30	31	21.2	30
Blue Rapids, Kans	20	20	21	21.5	20–21
		25	27	32.6	26
		30	Sept. 1	25.0	31
Randolph, Kans	22	26	28	28.45	26
		30	Sept. 1	25.0	31
Kansas:					
Ogden, Kans	18	26	26	19.0	26
Manhattan, Kans	17	26	28	22.65	27
		31	Sept. 1	17.9	31
Wamego, Kans	16	26	28	19.8	27
Topeka, Kans	21	26	28	24.1	27–28
LeCompton, Kans	17	26	29	19.6	27
Lawrence, Kans	18	27	29	20.0	28
Grand:					
Chillicothe, Mo	18	26	28	23.1	27
Brunswick, Mo	12	28	30	15.0	29
Osage:					
Quenemo, Kans	30	27	27	31.2	27
La Cygne, Kans	25	27	30	27.3	29
Trading Post, Kans	24	26	30	26.2	27
Osceola, Mo	20	27	29	22.7	29
Lakeside (Bagnell Dam), Mo	60	28	30	60.1	29–30
Missouri:					
Hermann, Mo	21	30	31	21.3	30–31
St. Charles, Mo	25	30	Sept. 1	26.25	31
WEST GULF OF MEXICO DRAINAGE					
Nueces: Cotulla, Tex	15	29	(2)	26.65	30
Rio Grande:					
Rio Grande City, Tex	21	24	26	26.3	25
		29	Sept. 1	26.6	30
		27	29	21.5	27
Hidalgo, Tex	21	29	(2)		
Mercedes, Tex	21	25	(2)		

[1] Provisional.
[2] Continued at end of month.